**Center Innovation Fund: JSC CIF**

# Avatar Robot for Crew Performance and Behavioral Health

Completed Technology Project (2013 - 2013)

## Project Introduction

This project investigates the effectiveness of using an avatar robotic platform as a crew assistant and a family member substitute. This type of avatar robot is particularly useful for maintaining crew behavioral health during long-term crew isolation. An avatar robot is both a physical and graphical representation of a person at a remote location and acts as a surrogate for that person. The teleoperated avatar robot can interact with its environment on behalf of the person not present, thus providing physical and psychological assistance to others. The robot offers real-time motion control as well as speech and video communication with the people and environment at the remote site. It can be equipped with remotely controlled manipulator arms to carry out tasks. Such a platform can be deployed on the ISS and other future near-Earth habitats, enabling the ground crew to assist the onboard crew on tasks. For facilitating crew behavioral health, the robot can be controlled by, for example, a crew family member and thus can act as a surrogate for the family member. Similiarly, the crew can also control the robot at his/her home to provide closer interactions with his/her family members. Currently, the impact of such a system to the crew's behavioral health is unknown. The proposal avatar robot platform can also be used to develop an ideal human/robot control/command interface; effectively controlling/commanding such a robot with multi-modal parallel outputs still requires much research. We will develop an avatar robot platform and perform preliminary evaluations to assess its potential benefits as a remote human surrogate for space-related applications.

## Anticipated Benefits

For NASA missions, such a platform can be deployed on the ISS and other future near-Earth habitats, enabling the ground crew to assist the onboard crew on tasks, for facilitating crew behavioral health by serving as either a crew member or his/her family member's surrogate. There is also great education outreach benefits by enhancing the level of interactions between the crew and the students.

Project Image Avatar Robot for Crew Performance and Behavioral Health

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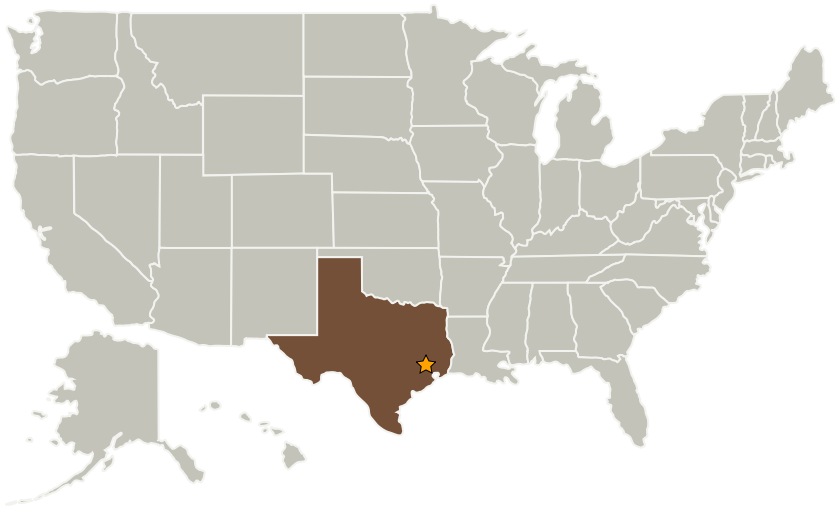
## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Johnson Space Center(JSC) | Lead Organization | NASA Center | Houston, Texas |

| Primary U.S. Work Locations |
|---|
| Texas |

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Johnson Space Center (JSC)

**Responsible Program:**

Center Innovation Fund: JSC CIF

## Project Management

**Program Director:**

Michael R Lapointe

**Program Manager:**

Carlos H Westhelle

**Project Manager:**

Douglas T Wong

**Principal Investigator:**

Douglas T Wong

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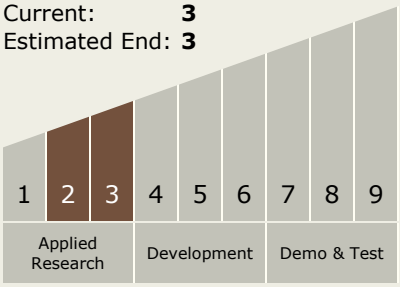
## Images

**12123-1375973250145.jpg**
Project Image Avatar Robot for Crew Performance and Behavioral Health
*(https://techport.nasa.gov/image/2181)*

**12123-1375976263970.jpg**
Project Image Avatar Robot for Crew Performance and Behavioral Health
*(https://techport.nasa.gov/image/2182)*

## Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**




## Technology Areas

**Primary:**

- TX10 Autonomous Systems
  - TX10.2 Reasoning and Acting
    - TX10.2.4 Execution and Control